

CLAIMS

1. A slitting saw used to cut an opening in a pipe comprising:
 - a) a housing;
 - b) a cutting blade apparatus; and
 - 5 c) a drive assembly for rotating said cutting blade apparatus, the drive assembly including a gear train including a series of shafts including a drive shaft, and idler shaft, and a cutter shaft each of said shafts being journaled in bearings for rotation in said housing wherein the cutting blade is operatively coupled to the cutter shaft, said drive assembly further including a drive motor for rotating the gear train.
- 10 2. The slitting saw in claim 1 wherein the gear train includes:
 - a) a first and second bevel gear wherein the first bevel gear rotates on a horizontal axis and the second bevel gear rotates on a vertical axis, the vertical axis provided by the drive shaft, wherein rotation of the first bevel gear transfers rotational motion to the drive shaft;
 - 15 b) a first helical gear mounted on the drive shaft and coupled in driving relation to a second helical gear mounted on the idler shaft wherein the first and second gears mesh so as to impart rotation to the idler shaft; and
 - c) a third helical gear is mounted on the idler shaft and a fourth helical gear is mounted on the cutter shaft and meshing with the third helical gear so as to transfer
 - 20 rotational motion from the idler shaft to the cutter shaft.
3. The slitting saw in claim 2 wherein:
 - a) the drive shaft has one threaded end and is journaled for rotation in said

housing by a first and second bearings where the first and second bearings are mounted proximate opposite ends the drive shaft;

b) a first spacer is mounted on the drive shaft between the first bearing and the first helical gear;

5 c) a second spacer is mounted on the drive shaft between the second bevel gear and the second bearing; and

d) the second bearing is held on the drive shaft by a washer and a nut screwed onto the one threaded end.

4. The slitting saw in claim 2 wherein:

10 a) the idler shaft is journaled for rotation by a third and fourth Timken bearing where the third Timken bearing is mounted at the base of the idler shaft and the fourth Timken bearing is mounted on the top of the idler shaft;

b) a spacer is mounted between the top of the third helical gear and the fourth Timken bearing so that the fourth Timken bearing is properly aligned; and

15 c) the fourth Timken bearing is fastened on the idler shaft by a washer and nut.

5. The slitting saw in claim 2 wherein:

a) the cutter shaft is journaled for rotation by a fifth and sixth Timken bearing where the fifth Timken bearing is mounted beneath the fourth helical gear;

20 b) a spacer is placed between the top of the fourth helical gear and the sixth Timken bearing so as to align the sixth Timken bearing and fourth Timken bearing; and

c) the sixth Timken bearing is fastened to the cutter shaft by a nut and washer.

6. The splitting saw in claim 1 wherein the housing enclosing the drive assembly includes

5 a) a bottom cover plate on which the drive shaft, idler shaft, and cutter shaft rest;

b) a gearbox case for housing the helical gears and the horizontal axis bevel gear;

c) a bearing case for the fourth and fifth Timken bearings;

10 d) a bevel gear case for housing the vertical axis bevel gear, and second Timken gear.

7. The splitting saw in claim 6 wherein the bottom cover plate includes two annular resources for receiving a bottom portion of the drive shaft and a bottom portion of the idler shaft.

15 8. The splitting saw in claim 7 wherein the bottom cover plate further includes an annular aperture for receiving the bottom portion of the cutter shaft.

9. The splitting saw in claim 7 wherein the cutting apparatus includes:

a) a single lip seal;

20 b) an annular collar with a central annular aperture for receiving the cutter shaft;

c) a cutting blade; and

d) a lock nut for securing the cutting blade to the annular collar.

10. The splitting saw in claim 9 wherein the cutting blade is a $37\frac{1}{2}^{\circ}$ bevel blade.

5 11. The splitting saw in claim 9 wherein the cutting blade is a 10° bevel sever blade.

12. The splitting saw in claim 9 wherein the cutting blade is carbide sever blade.

13. The splitting saw in claim 6 wherein the gearbox case includes:

10 a). an annular side aperture for receiving the horizontal axis bevel gear, and a curved indent to allow for rotation of the horizontal axis bevel gear;

b) a plurality of slots for receiving the gear train.

14. The splitting saw in claim 1 wherein the drive motor is an electrically powered motor.

15 15. The splitting saw in claim 1 wherein the drive motor is a pneumatically powered motor.

16. The splitting saw in claim 1 wherein the drive motor is a hydraulically powered motor.